TRANSFORMING CONSTRUCTION NETWORK PLUS

ROUND 1: CALL FOR SMALL PROJECTS

This is an open call for proposals, for up to 10 projects, up to 9 months' duration, to be funded through the Transforming Construction Network Plus (N+). Projects should address the biggest problems facing the construction industry, by focussing on the gaps, inter-relationships and under-explored regions of this domain, spanning digital, energy, construction and manufacturing expertise, in line with the expectations of the Industrial Strategy Construction Sector Deal. There is no minimum value for a request, but the maximum that shall be awarded to any single project is £100,000 (at 80% FEC).

Key dates

Call opens – launch date	Friday 1 February 2019
Briefing Workshop, London	Tuesday 12 February 2019
Briefing Workshop, Manchester	Wednesday 13 February 2019
Closing time and date for applications	16.00, Friday 29 March 2019
Funding decision	Thursday 25 April 2019
Projects may start from	Wednesday 1 May 2019
Expected end date for Round 1 projects	Friday 31 January 2020

Successful teams will be required to attend and make presentations at the following events:

N+ Strategy Board meeting	Tuesday 16 July 2019
N+ Annual Conference, London	Thursday 19 September 2019

Submissions

- To download an application pack, visit the Transforming Construction N+ website
- The deadline for submissions to Round 1 is 16.00, Friday 29 March 2019
- Submissions should be sent to this email address: enquiries.tcnetworkplus@ucl.ac.uk.

Contact

For all enquiries about the Call, please contact enquiries.tcnetworkplus@ucl.ac.uk and join our mailing list here.

Background: The Transforming Construction Challenge

The Transforming Construction Challenge (TCC) is administered by UK Research and Innovation (UKRI) and supported through the UK Government's Industrial Strategy Challenge Fund (ISCF)[1]. It seeks to revolutionise the way the UK designs, constructs and operates buildings and infrastructure[2] by realising the potential for the integration of advanced manufacturing both off, and on site, with state-of-the-art digital design, while realising the potential for Active Buildings powered by integrated energy generation and storage technologies.

The **Transforming Construction Challenge** comprises:

- £72m for a Core Innovation Hub (CIH) delivered by a partnership between the Manufacturing Technology Centre, the University of Cambridge Centre for Digital Built Britain and the Building Research Establishment supporting the development and use of technologies such as digital design, advanced manufacturing, robotics, drones and augmented and virtual reality;
- £36m for an Active Building Centre delivered by a consortium led by Swansea University, seeking to remove barriers and accelerate market adoption of solar-powered building design; and
- Up to £59m for **Collaborative Research and Development** (CR&D), including Innovate UK (First Round with up to £12.8m total fund in July 2018) and EPSRC (Research Leadership call in September 2018 with up to £8m total fund).
- £2m for the **Transforming Construction Network Plus**, of which £1m is set aside to fund calls for small projects – see next page for details.

The scope includes bringing together the Construction, Manufacturing, Energy and Digital sectors to focus on how buildings can be manufactured, designed and managed through-life using digital technology and how buildings can generate power to meet their own requirements contributing to a sustainable energy mix.

The technical objectives of the **Transforming Construction Challenge** are:

- Increased adoption of digital manufacturing approaches and active energy technologies in new construction projects (increase in pre-manufactured value).
- Increase in productivity of construction projects (target: 15% over current methods).
- Scalable approaches for faster delivery and greater certainty of construction projects (target: 50% inception to completion from 2010 baseline).
- Develop active (energy) building components based on the product platforms and reduce cost of delivery of active buildings to be nearer standard market cost.
- Reduction in cost of construction and whole-life cost of built assets (target 33% over 2010 baseline).
- Improved whole-life value of built assets (user performance), including reduction in carbon intensity (50% target).

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[1] *https://www.ukri.org/innovation/industrial-strategy-challenge-fund/transforming-construction/#pagecontentid-0*

[2] *Buildings are the focus of this Call, and the TCC programme. However, we acknowledge that infrastructure can play an important role within the transforming construction agenda. For instance, infrastructure can be viewed as part of a system of built assets, within which buildings are the focus for this Call.*

About the Transforming Construction Network Plus

The **Transforming Construction Network Plus (N+)** unites construction's academic and industrial communities to create a new research and knowledge base, dedicated to addressing the systemic problems holding back the sector.[3]

The N+ is led by the UCL Bartlett School of Construction and Project Management, in partnership with Imperial College London and WMG, University of Warwick. It is funded by UKRI, as an investment under the Industrial Strategy Challenge Fund (ISCF). The aim of the N+ is to provoke, enable and amplify innovation, through four main objectives:

- **Knowledge:** to inform new research and development (R&D) models and government policy that link digital, construction, manufacturing and energy to improve productivity
- **Community building:** to advance collaborations through knowledge exchange and debate, beyond what is currently possible
- **Business models**: to produce user-informed, practical resources that accelerate pathways to manufacture and delivery
- **Investment and legacy**: to de-risk and increase construction sector business R&D spend and enable new R&D collaborations that outline the N+ two-year grant.

The N+ focuses on supporting research that takes a holistic approach, which means thinking of construction as a production 'system' for built assets that adds value to cities and their infrastructures. Transforming design, construction and operation of buildings is a problem that demands input from a wide range of backgrounds and disciplines, which is why major, coordinated investments are being made through the TCC.

Within this, the research supported through the N+ will focus on the gaps, inter-relationships and under-explored regions of this domain, spanning digital, energy, construction and manufacturing expertise, in line with the expectations of the Industrial Strategy Construction Sector Deal. The N+ will address a future in which the UK designs, constructs and operates buildings by realising the potential for integrating advanced off and on site manufacturing with state-of-the-art digital design and energy generation and storage technologies. By exploring and synthesising knowledge of how people and communities experience and interact with the built environment, the N+ will foster new approaches to the provision of inspiring buildings that give rise to greater user satisfaction and productivity. The N+ will help transform the way buildings are designed, built, powered, managed, and used in the future. The N+ will bring academics together, with industry and policy representatives, through networking activities (such as workshops and conferences) and skills-building events.

The N+ will support research projects (see next section), via two rounds of calls for small projects, and host a programme of events through 2019 and 2020. Further information on the N+ can be found at the Transforming Construction N+ website – this includes a link to a recording of the talks and discussion from the N+ launch event on 20 November 2018.

For enquiries about the N+, please contact enquiries.tcnetworkplus@ucl.ac.uk, and join our mailing list here.

[3] *https://www.ucl.ac.uk/bartlett/construction/news/2018/nov/ucl-launches-interdisciplinary-research-community-revolutionise-delivery-uk*

Funding calls

The N+ provides funding for research projects that aim to address some of the biggest problems currently facing the construction industry. The funding for projects is to further the aims of the Network and the challenge to synthesise and bring the best existing and new knowledge to the rest of the programme and maximise exposure across industry.

Two rounds of funding calls will be launched, the first of these being this Call. Following its launch in November 2018, the N+ aims to distribute £1m of funding through small project calls over the next two years, with this being the first of two calls. The second will be launched on 19 September 2019. This Call document contains all the key information about the Round 1 Call for Small Projects.

Call for Small Projects: Round 1

This section describes in detail the scope, ambition and impact that applicants are expected to address in their proposals.

Funding is available for Small Projects – which could address research questions derived from prior academic study or respond to industry need in the Transforming Construction Challenge's core themes of:

- designing and managing buildings through digitally-enabled performance management
- constructing quality buildings through an offsite manufacturing approach
- reducing energy demand by improving quality of build and powering buildings through embedded active technologies[4].

The research supported through the N+ should focus on the gaps, inter-relationships and under-explored regions of this domain, spanning digital, energy, construction and manufacturing expertise. The N+ will support research that takes a **holistic** approach, in which construction is viewed as a means of producing built assets to benefit their societies. Novelty in approach is very much recommended.

Transforming design, construction and operation of buildings is a problem that demands input from a wide range of backgrounds and disciplines, so new, **interdisciplinary** collaborations are strongly encouraged. Drawing ideas, methods or theories from other disciplines could hold great potential. Taking a novel or different (e.g. interdisciplinary) perspective on cross-cutting sectoral challenges, such as procurement, productivity and performance is welcomed.

Projects that involve industry partners are particularly welcomed, although it is not necessary to have industry partners to apply to this Call.

Importantly, **applicants must focus on how their research will contribute to the Transforming Construction Challenge, as an industry movement, idea, and change programme**. Some applicants may frame this as an 'engaged scholarship' approach, in which education contributes to the development of a stakeholder or user community. In addition, it is also suggested that projects consider carefully how their work might connect with, and enhance work in the centres that are funded by the Transforming Construction Challenge, i.e. the Transforming Construction Alliance and the Active Buildings Centre.

New ideas around new business models, ideas for adaptations, and disruption might tackle the notion that there is a tipping point that the industry needs to reach to enable it to transform – and

[4] *Please note that retrofit is outside of the scope of this programme.*

to explore how, what or where this tipping point is, and how this can be accelerated. It is possible that greater vertical (supply-chain integration) needs to be a feature of a transformed sector, so applicants may wish to explore the implications of this. It may also be fruitful to examine how disruption in other sectors might benefit construction and what the key drivers for change might be.

Projects could address any or several stages in the life of a construction project from inception through to operation and end of life. Consideration, for instance, could be given to the impact of interactive tools and common platforms that could transform the process of documenting and communicating design intent, freeing design professionals to develop ideas and optimise performance outcomes. Projects could examine the role of manufacturing, learning lessons and developing approaches from other industry sectors to be applied to onsite or offsite manufacturing of buildings and infrastructure.

Projects are expected to focus on research and development that lies within Technology Readiness Levels (TRL) 3-8, or that draws on existing insights to test and validate solutions. They could involve desk research, applied study, action research, secondment and other novel methods of research that are appropriate to the project aims. Projects should have outcomes that deliver impact, but they may also lay the foundations for further work, e.g. by supporting the development of proposals for more substantive future research.

A strong vision of anticipated impact and clear and viable steps towards a sustained programme of research is expected. Outputs are most likely to be in the form of a report, but other outputs such as tools, proof of concept, multi-media demonstrations and other innovations, are encouraged. Data is likely to be an important feature of most projects; a data management plan is required to ensure that data is: appropriately curated, stored and made available for future research, where feasible.

Applicants are encouraged to attend (or view by webcast) one of the briefing workshops that are planned, to stimulate ideas and develop collaborative relationships – see **Key Dates**. These will form an important opportunity to understand more about the Call and what is expected.

Eligibility criteria

This section outlines who is eligible to apply for, and lead a Small Project.

- Any organisation that is eligible to receive **UKRI funding** is eligible to apply for a Small Project, typically academic institutions. Further information on other independent research organisations that are also eligible for funding can be found here.
- Every Small Project shall have a named **Lead University**. This organisation may apply independently, or may include other Project Partners in its application.
- **Industrial participation and 'match funding'** is strongly encouraged and desirable, but taking account of the limited time available for proposal preparation, letters of support are not essential. Estimates of contributions (whether cash or in-kind) would be a useful addition to the application; industry participation shall be considered in the review process, but only in respect of the additionality it brings, under two specific criteria: 'Management' and 'Impact' (see Assessment Criteria section). In other words, simply having industry participation does not mean a proposal will attract a higher score – the choice needs to be shown as appropriate and adding value to the proposal, i.e. 'is it necessary?' and 'what does it add?'.
- The award holder may include other stakeholders (Project Partners) in their project team, but **funding shall be awarded only to the Lead University**. UCL will contract with the

Lead University only. Any subsequent distribution of funding to Project Partners shall be the responsibility of the Lead University.

- Each project shall have a named **Principal Investigator** (PI). The PI shall be a person who shall be employed continuously by the Lead University (i.e. their post will outlast the project). The PI shall be considered the key contact for the award, taking responsibility for delivery, budget and reporting. The PI must be from the organisation that will administer the grant. The PI will take intellectual leadership of the project and manage the research. All named investigators are responsible for ensuring that successful proposals are undertaken and completed in the manner specified.
- Any funding requested for staff shall only be awarded for **named individuals**, who are already in post in the organisation. The short duration of the Small Projects precludes the option of making new appointments in the funding period.
- **Early career researchers**[5] (ECR), (including post-doctoral researchers and new/probationary lecturers) are eligible to participate and are encouraged to do so, but shall not act in the role of PI. Where an ECR is the primary actor in a Small Project, a PI shall be named and shall be considered as the key contact for the award, taking responsibility for delivery, budget and reporting. In this case, a request for a modest percentage of the PI's time may be included in the request (expected to be at least 2%).
- Regardless of whether successful or not, all individuals and/or organisations that submit an application in Round 1 shall remain **eligible to apply again in Round 2** (opens 19 September 2019). Resubmissions of previous unsuccessful applications from Round 1 will need to show how any feedback has been taken on board.

Expectations and requirements

This section explains what is expected of those who are awarded a Small Project.

Active participation in the N+ and its events programme is expected of all those who are awarded Small Projects. This applies to the PI and all other academic staff, researchers, or Project Partners involved. The overall success of the N+ relies on those involved demonstrating positive, interdisciplinary engagement with the Transforming Construction agenda.

More broadly, applicants shall put forward clear plans on how best to build links and contacts with potential beneficiaries and users, and to work towards co-production of knowledge with research users. It is vital that the economic and societal impact of all projects funded by UKRI is maximised.

The PI and other named staff shall ensure the proposed research will be carried out to a high ethical standard and that all necessary ethical approval is in place before the project commences and all risks are minimised. Small Project recipients shall also be expected to:

1. **Provide updates on progress (if requested) and comply with mid and end project requests for reporting** (both during the project and post-completion). Reporting requirements will be provided to successful teams. These shall align with UKRI templates and ResearchFish (see ResearchFish website) and include commentary on whether aims have been achieved, methods used, data produced, publications or other outputs, other outcomes, impact achieved and planned, problems encountered, and forward plans.
2. **Attend N+ events, as required**. This shall include presentations to the N+ Strategy Board and Annual Conference in September 2019 (see **Key Dates**).

[5] *Early Career Researchers shall typically be no more than four years post award of PhD/EngD.*

3. **Promote and amplify the N+ through their own networks**. The N+ Communications Officer will maintain contact with successful teams and those subscribed to receive updates to ensure that important information and announcements are disseminated widely.

Assessment and award process

This section outlines how Small Project proposals shall be handled in a rapid, streamlined review process.

- **Step 1: All Small Project proposals shall be sent out for peer review.** Peer reviewers will score and comment on each proposal, using only the assessment criteria and scoring system below. A minimum of two peer reviews shall be sought for each proposal, none of which will be from reviewers in any of the organisations named on the proposal[6].
- **Step 2: Peer reviews shall be considered in a 'panel' style evaluation meeting.** In line with normal practice in assessing research grants, the reviews for each proposal will be presented by an individual wholly unconnected with any of the parties named on a given proposal, at a meeting of the N+ Operations Board. This meeting will produce a ranked list of projects, in order of merit, noting which are recommended for funding (fundable) and those which are not (not fundable).
- **Step 3: Final list of projects recommended for funding shall be ratified by the N+ Strategy Board.** The outcome from Step 3 will be considered at a special meeting of the Strategy Board, which is chaired by an independent, non-academic individual and includes representatives from UKRI. This meeting will ratify the ranked list of projects and authorise the offer of awards to the successful project teams.
- **Step 4: All applicants shall be notified of the decision in respect of their proposal.** Successful teams shall be contacted by the Network Manager, and be asked to proceed to contract negotiation stage, at which time the PI shall ensure that their organisation's research contracts staff are ready and able to proceed swiftly to reach agreement.
- **Step 5: The N+ shall publicise the results of the Round 1 Call.** The N+ Communications Officer shall liaise with successful project teams (and their own communications teams), and coordinate the release of information (e.g. through press release, social media and website updates), once contracts have been agreed and signed.

Assessment criteria

This section specifies the headings against which Small Project proposals shall be assessed through the peer review and panel processes.

There are five Primary Criteria against which all proposals will be assessed. Each contains three key points, as shown below. All applications will be assessed against the same criteria, regardless of the size of request. Reviewers will assess the size of the request solely in the *Value for Money* criterion. Proposals will be scored against each of the five criteria on a scale of 0-3, where: 0 = no sub-criteria met, through to 3 = all sub-criteria fully met.

[6] *In line with this, and to demonstrate transparency of process – in the case of ALL applications from staff in the organisations managing the N+ (i.e. University College London, Imperial College London, and the University of Warwick), peer reviews will not be sought from any of these organisations. This is to support the principles of fairness, integrity and objectivity in the assessment process.*

Novelty	• *State clearly the aim and objectives of the project, its level of ambition, novelty, the expected addition to knowledge and describe its fit to the aims of the TCC* • *Explain the need for this particular project and note why your approach is the most appropriate, and how it might be scalable* • *Describe the problem that is to be investigated, with reference to the evidence base (including references to literature)*
Quality	• *Describe and justify the research approach/method to be taken, making clear links to which team members will be responsible for delivery* • *Explain how the project engages with the idea of interdisciplinary enquiry* • *State the proposed outputs and outcomes from the project, with reference to destination journals, conferences and industry groups, and where applicable, potential follow-on projects*
Management	• *Justify why this team is the most appropriate to deliver the project, with reference to their track record/s, and Equality, Diversity and Inclusion (ED&I) – note any industrial collaborators, why they are needed, and what they bring to the team* • *Explain (with a timetable[7] and work package/task structure) how you will ensure you deliver the project on time, including sufficient engagement and networking as part of the programme* • *Provide an account of the key risks and how you will manage these (include any risks in respect of ethics, data management[8], and staffing)*
Value for money	• *Provide a clear justification for all resources requested[9]* • *Explain why your request is appropriate, given your project scope, ambition etc.* • *State how you will contribute to the N+, making reference to your long-term plans for follow-on funding*
Impact[10]	• *Describe the long-term effect that you expect your project to have on the Transforming Construction agenda, and how you would expect this impact to be measured or recognised.* • *Explain your overall approach to industry engagement and/or collaboration, including which people/organisations you will involve and how you will ensure this engagement* • *Set out your pathway/s to impact, including your target audience/s and beneficiaries, how you will reach them, and what change you expect to see*

[7] A clear timetable or Gantt chart for the project and the intended progress of the research through the different stages.

[8] Research data quality and provenance are important. Research data generated must be well-managed by the grant holder during the grant period to enable their data to be best exploited for further research.

[9] The justification of resources should explain why the resources requested are appropriate for the research proposed, taking into account the nature and complexity of the research proposal.

[10] Describe how the potential impacts of your research will be realised. This is specific to users and beneficiaries of the research who are outside of the academic research community (e.g. industry and policy makers). Applicants should consider what is achievable and expected for research of this nature.

Funding available and eligible costs

This section provides information on the funding available for Small Projects.

The N+ intends to award around £1million to Small Projects, across two calls. In Round 1, the aim is to award at least half of this amount, subject to quality thresholds being met, and contracts being agreed in a timely manner. It is expected that up to 10 projects will be funded in each Round. If successful, applicants will receive 80% of the full economic costs on proposals submitted up to a maximum of £100,000 and the host institution shall support the remaining 20%. There is no minimum value for a request, but the maximum amount that shall be awarded to any single project is £100,000 (at 80% FEC). Applicants are advised that value for money is a criterion in the assessment, so should ensure that their request is appropriate for the scope, ambition and expected impact, and can viably be spent within the maximum nine months permitted. Proposals at the higher end of the range will necessarily be subject to greater scrutiny. Details of the request should be justified in the **Round 1 Small Projects Application Form** and set out in detail in the **Round 1 Small Projects Budget Sheet**. A suitably qualified member of staff should prepare all costings, such that they are in line with UKRI expectations.

Costs shall be requested under the following headings:

- **Directly Allocated staff**[11]: those who will be working directly on the project, but whose involvement on the grant can only be based on an estimate of the time the work will take (e.g. investigators).
- **Directly Incurred staff**: those whose time on the project is actual, auditable and verifiable (e.g. researchers and technicians).
- **T&S**: travel and subsistence required, including information on destination and purpose.
- **Other Directly Incurred costs**: project specific consumables, consultancy fees, and equipment costing less than £10,000. Costs associated with UK co-investigators in business, civil society or government bodies may be requested, however these would not be expected to exceed 10% of the value of the total amount requested. Applications that exceed this will require additional justification about why this amount is appropriate and represents value for money.
- **Other Directly Allocated costs**: e.g. support staff salaries, a share of the costs of departmental support staff and/or the costs of access to major research facilities.
- **Estate and Indirect costs**: these are specific to each research organisation, and do not require justification.

Ineligible costs

The following may <u>not</u> be requested under this Call:

- Associated studentships
- Any equipment costing £10,000 or more (including VAT)
- Costs associated with International Co-Investigators
- Costs associated with UK co-investigators in business, civil society or government bodies (where this exceeds 10% of the total amount requested)
- Sub-contracted social surveys, or costs for surveys, that exceed £10,000.

ENDS

[11] *The PI allocation can be as low as 2% (e.g. if this is a senior member of staff guiding an early career researcher). Otherwise, a PI is expected to be allocated at around 20%. Co-Investigators may be allocated at around 10%. If an early career researcher is taking a lead role, then their allocation should be at least 30%.*